**Final engineering report**

DRAFT

**Rockfarmer 37th Avenue**

82-13 37th Avenue

Jackson Heights, Queens County, New York 11372

Block 1456, Lots 35 & 41

NYSDEC Site No. C241212

SEPTEMBER 2022

PREPARED FOR:

37th Avenue Owner LLC; Horizon 37th Ave, LLC; and RFC Ketcham 37th Ave, LLC

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**VERTEX PROJ****ECT NO:** 48122

**CERTIFICATIONS**

I, Richard J. Tobia, P.E., am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for implementation of the remedial program activities, and I certify that the Remedial Action Work Plan was implemented and that all construction activities were completed in substantial conformance with the Department-approved Remedial Action Work Plan.

I certify that the data submitted to the Department with this Final Engineering Report demonstrates that the remediation requirements set forth in the Remedial Action Work Plan and in all applicable statutes and regulations have been or will be achieved in accordance with the time frames, if any, established for the remedy.

I certify that all use restrictions, Institutional Controls, Engineering Controls, and/or any operation and maintenance requirements applicable to the Site are contained in an environmental easement created and recorded pursuant ECL 71-3605 and that all affected local governments, as defined in ECL 71-3603, have been notified that such easement has been recorded.

I certify that a Site Management Plan has been submitted for the continual and proper operation, maintenance, and monitoring of all Engineering Controls employed at the Site, including the proper maintenance of all remaining monitoring wells, and that such plan has been approved by Department.

I certify that all documents generated in support of this report have been submitted in accordance with the DER's electronic submission protocols and have been accepted by the Department.

I certify that all data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that all information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class “A” misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Richard J. Tobia, P.E., of Vertex Engineering, PC, am certifying as Owner’s Designated Site Representative and I have been authorized and designated by all site owners to sign this certification for the Site.

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Richard J. Tobia, P.E. Seal

 095039-1 September 26, 2022

License Number Date

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**LIST OF ACRONYMS**

| **Acronym** | **Definition** |
| --- | --- |
| 1,1,1-TCA | 1,1,1-Trichloroethane |
| AWQS | Ambient Water Quality Standards |
| BCA | Brownfield Cleanup Agreement |
| BCP | Brownfield Cleanup Program |
| BGS | Below Ground Surface |
| CAMP | Community Air Monitoring Plan |
| CLASS GA | Groundwater Effluent Limitations |
| COC | Contaminant of Concern |
| CP Plan | Citizen Participation Plan |
| CVOC | Chlorinated Volatile Organic Compound |
| DUSR | Data Usability Summary Report |
| EE | Environmental Easement |
| ELAP | Environmental Laboratory Approval Program |
| FER | Final Engineering Report |
| GPR | Ground-Penetrating Radar |
| HASP | Health and Safety Plan |
| IRM | Interim Remedial Measure |
| mcg/m3 | Micrograms per Cubic Meter |
| MDL | Method Detection Limit |
| mg/kg | Milligrams per Kilogram |
| NYCDOB | New York City Department of Buildings |
| NYCRR | New York Codes, Rules, and Regulations |
| NYSDEC | New York State Department of Environmental Conservation |
| NYSDOH | New York State Department of Health |
| OSHA | Occupational Safety and Health Administration |
| PBS | Petroleum Bulk Storage |
| PCE | Tetrachloroethene |
| PE | Professional Engineer |
| PID | Photo-Ionization Detector |
| PPM | Parts Per Million |
| PVC | Poly Vinyl Chloride |
| QAPP | Quality Assurance Project Plan |
| RAO | Remedial Action Objective |
| RAWP | Remedial Action Work Plan |
| RI | Remedial Investigation  |
| RUSCO-GW | Restricted Use Soil Cleanup Objective – Groundwater Protection |
| SCO | Soil Cleanup Objective |
| SEQRA | State Environmental Quality Review Act |
| SMP | Site Management Plan |
| SSDS  | Sub-Slab Depressurization System |
| TCE | Trichloroethene |
| ug/L | Micrograms Per Liter |
| USEPA | United States Environmental Protection Agency |
| UST | Underground Storage Tank |
| UUSCO | Unrestricted Use Soil Clean Objective |
| VOC | Volatile Organic Compounds |

**FINAL ENGINEERING REPORT**

**Rockfarmer 37th Avenue**

**82-13 37th Avenue**

**Jackson Heights, Queens County, New York 11372**

**Block 1456, Lots 35 & 41**

**NYSDEC Site No. C241212**

# BACKGROUND AND SITE DESCRIPTION

37th Avenue Owner LLC, Horizon 37th Ave, LLC, and RFC Ketcham 37th Ave, LLC entered into a Brownfield Cleanup Agreement (BCA) with the New York State Department of Environmental Conservation (NYSDEC) in July 2018, to investigate and remediate a 0.46-acre property located in Jackson Heights, Queens County, New York. The property was remediated to restricted residential, commercial, and industrial use, and will be used for commercial office, retail, and parking use.

The Site is located in the County of Queens, New York and is identified as Block 1456 and Lots 35 and 41 on the Queens Tax Map # 8. The Site is situated on an approximately 0.46-acre area bounded by residential complexes to the north, 37th Avenue to the south, 83rd Street to the east, and 82nd Street to the west (see **Figure 1**). The boundaries of the Site are fully described in **Appendix A**: Survey Map, Metes and Bounds.

An electronic copy of this Final Engineering Report (FER) with all supporting documentation is included as **Appendix B**.

# SUMMARY OF SITE REMEDY

## REMEDIAL ACTION OBJECTIVES

Based on the results of the Remedial Investigation (RI), the following Remedial Action Objectives (RAOs) were identified for this Site.

### Groundwater RAOs

RAOs for Public Health Protection

* Prevent ingestion of groundwater containing contaminant levels exceeding drinking water standards.
* Prevent contact with, or inhalation of, volatiles emanating from contaminated groundwater.

RAOs for Environmental Protection

* Remove the source of ground or surface water contamination.

### Soil RAOs

RAOs for Public Health Protection

* Prevent ingestion/direct contact with contaminated soil.
* Prevent inhalation of, or exposure to, contaminants volatilizing from contaminated soil.

RAOs for Environmental Protection

* Prevent migration of contaminants that would result in groundwater or surface water contamination.

### Soil Vapor RAOs

RAOs for Public Health Protection

* Mitigate impacts to public health resulting from existing, or the potential for, soil vapor intrusion into the Site building.

## DESCRIPTION OF SELECTED REMEDY

The site was remediated in accordance with the remedy selected by the NYSDEC in the Decision Document dated April 2021.

The factors considered during the selection of the remedy are those listed in Title 6 New York Codes, Rules, and Regulations (NYCRR) 375-1.8. The following are the components of the selected remedy:

1. Excavation of soil/fill exceeding unrestricted Soil Cleanup Objective (SCOs) listed in **Table 1** to a depth of 3.0 feet below the Site building basement slab (approximately 14.0 feet below ground surface [bgs]).

2. Construction and maintenance of an active sub-slab depressurization system (SSDS) to prevent the potential migration of vapors that may build up beneath the slab to the indoor air of the Site building.

3. Treatment of residual soil impacts via operation of the active SSDS.

4. Maintenance of an impervious cover system consisting of concrete sidewalk (approximately 4-inch-thick concrete and 2-inch base stone layer), brick sidewalk (approximately 3.5-inch-thick brick and 2-inch base stone layer), and concrete building slab (approximately 4-inch-thick concrete) to eliminate pathways to human exposure to remaining contaminated soil/fill remaining at the Site.

5. Execution and recording of an Environmental Easement (EE) to restrict land use and prevent future exposure to any contamination remaining at the Site.

6. Development and implementation of a Site Management Plan for long term management of remaining contamination as required by the EE, which includes plans for: (1) Institutional and Engineering Controls, (2) monitoring, (3) operation and maintenance and (4) reporting.

7. Periodic certification of the institutional and engineering controls listed above.

# INTERIM REMEDIAL MEASURES, OPERABLE UNITS AND REMEDIAL CONTRACTS

The information and certifications made in the Interim Remedial Measure Construction Completion Report, prepared by VERTEX and dated January 29, 2021, were relied upon to prepare this report and certify that the remediation requirements for the Site have been met.

## INTERIM REMEDIAL MEASURES

A Supplemental Pre-Design Investigation Work Plan, prepared by VERTEX and dated September 16, 2020, was submitted to the NYSDEC because the Volunteers were conducting interior renovations at the Site to accommodate new tenant occupancy, which work resulted in making accessible sections of the Site building slab. The report also included an Interim Remedial Measures (IRM) Work Plan, which outlined the proposed remedial actions to remove the soils exhibiting, or that previously exhibited, the elevated presence of tetrachloroethene (PCE) at soil sample location RF-9. Soil sample RF-9 was collected during the remedial investigation activities in February 2019, at a depth of 1.5 to 2.0 feet below the basement slab. The proposed IRM included a limited soil excavation and post-excavation soil sampling. The IRM Work Plan was approved by the NYSDEC on September 11, 2020.

On September 27, 2020, VERTEX directed the remedial contractor (Clean Globe Environmental (Clean Globe) of Brentwood, New York) to conduct soil excavation activities at the former RF-9 sampling location. The excavation location is depicted on **Figure 2**.

Upon removal of a portion of the concrete slab, Clean Globe was instructed to excavate an area approximately 2.0 feet by 2.0 feet by 3.0 feet deep. Excavated soils were placed into a 55-gallon steel drum. The soils encountered consisted of historic fill material (silts and sands with trace amounts of concrete and brick). Groundwater was not encountered during the IRM activities; therefore, no dewatering was required. Visual, olfactory, and photoionization detector (PID) screening of the excavation spoils was completed by VERTEX. PID readings ranged from 0.0 to 1.4 part per million (ppm), and no visual or olfactory evidence of a release was noted. Upon completion, the limits of the excavation in all directions were confirmed to have exhibited no PID readings above background.

To confirm the protectiveness of the soil remediation, a post-excavation soil sample was collected from the base of the excavation. The soil sample collected exhibited a PID reading of 0.0 ppm. The post-excavation soil sample (RF-9-PX) was collected at 3.0-3.5 feet below the basement slab. The soil sample was submitted to Alpha Analytical, Inc. (Alpha) in Westborough, Massachusetts (New York Environmental Laboratory Approval Program (ELAP) No. 11627) for volatile organic compound (VOC) analysis via United States Environmental Protection Agency (USEPA) Method 8260.

The VOC scan detected only three compounds above the method detection limit (MDL); acetone, 2-butanone (methyl ethyl ketone), and PCE. The results of the post-excavation soil sample analysis were compared to the NYSDEC Restricted Use SCO for Protection of Groundwater (RUSCO-GW) and for Unrestricted Use (UUSCO). Review of the soil analytical results identified the following compound exceeding a SCO:

| **CONSTITUENTS IN SOIL SAMPLES IN EXCESS OF SCOs** |
| --- |
| **Sample Location** | **Sample Depth (1)** | **Constituents****>RUSCO-GW** | **Constituents****>UUSCO** |
| RF-9-PX | 3.0-3.5 | Acetone | Acetone |

 (1) Feet below basement slab

Review of the post-excavation soil analytical data identified no VOCs exceeding the NYSDEC SCOs, except for acetone. Acetone was detected at 0.055 milligrams per kilogram (mg/kg), exceeding only the UUSCO of 0.05 mg/kg. PCE was detected at 0.00074 mg/kg: four orders of magnitude below the most stringent SCO. The low-level detections of acetone and 2-butanone are believed to be the likely result of laboratory contamination. **Table 2** summarizes the September 2020 post-excavation soil sampling results.

The excavation was backfilled with ¾-inch quarry stone, the concrete basement slab was restored, and the area proximate the excavation was cleaned.

To document the completion of the IRM activities, VERTEX prepared the *Interim Remedial Measure Construction Completion Report*, dated January 29, 2021. Based on the above information, no further investigation or remediation was warranted, and the NYSDEC approved the IRM Construction Completion Report on July 8, 2021.

#  DESCRIPTION OF REMEDIAL ACTIONS PERFORMED

Remedial activities completed at the Site were conducted in accordance with the NYSDEC-approved Remedial Action Work Plan (RAWP) for the Rockfarmer 37th Avenue site (August 2020). All deviations from the RAWP are noted below.

## GOVERNING DOCUMENTS

### Site Specific Health & Safety Plan (HASP)

All remedial work performed under this Remedial Action was in full compliance with governmental requirements, including Site and worker safety requirements mandated by Federal Occupational Safety and Health Administration (OSHA).

The Health and Safety Plan (HASP) was complied with for all remedial and invasive work performed at the Site.

### Quality Assurance Project Plan (QAPP)

The QAPP was included in Section 4.2 of the RAWP approved by the NYSDEC. The QAPP describes the specific policies, objectives, organization, functional activities and quality assurance/ quality control activities designed to achieve the project data quality objectives.

### Community Air Monitoring Plan (CAMP)

The CAMP was included in Section 4.4 of the RAWP approved by the NYSDEC. The CAMP was implemented during the limited soil excavation activities conducted in the basement. The CAMP, developed in accordance with New York State Department of Health (NYSDOH) guidance, provides real-time monitoring for VOCs and particulates typically at the downwind perimeter of designated work areas where known contaminated soils will be disturbed. For this application, the monitoring was tailored to the basement area.

VOCs were monitored with a PID at the perimeter of the immediate work area (i.e., the exclusion zone) on a continuous basis during invasive work. Concentrations in surrounding areas, i.e., hallways, nearby tenant spaces, were measured at the start of each workday and periodically thereafter to establish background conditions. The equipment could calculate 15-minute running average concentrations, which were compared to the levels specified below.

* If the ambient air concentration of total organic vapors at the perimeter of the work area or exclusion zone exceeded 5 ppm above background for the 15-minute average, work activities were temporarily halted and monitoring continued. If the total organic vapor level readily decreased (per instantaneous readings) below 5 ppm over background, work activities resumed with continued monitoring.
* If total organic vapor levels at the perimeter of the work area or exclusion zone persisted at levels in excess of 5 ppm over background but less than 25 ppm, work activities were halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities would resume provided that the total organic vapor levels outside the exclusion zone or half the distance to the nearest potential receptor, whichever is less - but in no case less than 20 feet, was below 5 ppm over background for the 15-minute average.
* If the organic vapor level was above 25 ppm at the perimeter of the work area, activities were shut down and the excavation area was covered in polyethylene until such time engineering controls, i.e., exhaust fan, could be used to mitigate the vapors.

Particulate concentrations were monitored continuously in the surrounding basement areas. The particulate monitoring was performed using hand-held, real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The monitoring equipment was equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration was visually assessed during all work activities.

* If the exclusion zone PM-10 particulate level was 100 micrograms per cubic meter (mcg/m3) greater than background (0) for the 15-minute period or if airborne dust was observed leaving the work area, then dust suppression techniques, including cordoning off the area was employed. Work continued with dust suppression techniques provided that downwind PM-10 particulate levels did not exceed 150 mcg/m3 and provided that no visible dust was migrating from the work area.
* If, after implementation of dust suppression techniques, PM-10 particulate levels were greater than 150 mcg/m3, work was stopped, and a re-evaluation of activities initiated. Work resumed if dust suppression measures and other controls were successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m3 and in preventing visible dust migration.

### Community Participation Plan

A Citizen Participation Plan (CP Plan) was prepared and submitted to the NYSDEC. The CP Plan was finalized in December 2018 and provided a summary of the Brownfield Cleanup Program (BCP) and citizen participation activities, site information, and project contacts.

Document repositories were established at the following locations and contain all applicable project documentation.

* Queens Library at Jackson Heights, 35-51 81st Street, Jackson Heights, NY 11372
* Queens Community Board 3, 82-11 37th Avenue, Suite 606, Jackson Heights, NY 11372
* NYSDEC Region 2, Hunter’s Point Plaza, 47-40 21st Street, Long Island City, NY 11101

Fact sheets, notifying the public of the availability of milestone documents and public comment periods, were distributed during the project. Based on the site characterization and RI findings, the remedial action was likely to represent all or a significant part of the final remedy; therefore, the NYSDEC required a 45-day public comment period. Following the issuance of the Certificate of Completion, a Fact Sheet was distributed.

## REMEDIAL PROGRAM ELEMENTS

### Contractors and Consultants

Principal personnel who participated in the remedial action include:

| **PROJECT TECHNICAL PERSONNEL AND CONTRACTOR** |
| --- |
| **COMPANY** | **TASKS** |
| Vertex Engineering, PC | Environmental consultant responsible for communications with the NYSDEC/NYSDOH, sample collection, environmental oversight during remedial activities, CAMP monitoring, and preparation of BCP documents. The certifying Engineer of Record of Richard Tobia, P.E. |
| DPK Land Surveying, LLC | Survey all monitoring wells at the Site. |
| Aquifer Drilling & Testing, Inc. | Installation of soil borings, temporary monitoring wells, and permanent monitoring wells at the Site. |
| Ground Penetrating Radar Systems Inc. | Performed utility clearance and geophysical evaluation. |
| Innovative Recycling Technologies | Off-site disposal of investigation-derived waste generated during remedial investigation activities (i.e., soil cuttings and purge development water). |
| NYCO Electric Corp. | Licensed electrician for the installation of the wiring for the SSDS. |
| Clean Globe Environmental | Contractor responsible for the installation of the SSDS and completion of the IRM excavation. |
| Alpha Analytical Inc. | ELAP-certified laboratory for the analysis of soil, groundwater, soil vapor, indoor air, and ambient air samples collected at the Site. |

### Site Preparation

As discussed in Section 3.1, a Supplemental Pre-Design Investigation Work Plan and IRM Work Plan was approved by the NYSDEC on September 11, 2020. The pre-design investigation and SSDS installation was partially completed from September 15 to 27, 2020, and the IRM soil excavation was completed on September 27, 2020. The RAWP was approved, and the Decision Document was issued by the NYSDEC on April 21, 2021. The SSDS piping installation was completed from May 11 to 13, 2021. The IRM Construction Completion Report was approved by the NYSDEC on July 8, 2021. SSDS start-up was July 16, 2021, commissioning was performed on August 25, 2021, and effectiveness testing was completed on November 16 and 17, 2021. At the request of the NYSDEC, a limited soil investigation was completed on October 28 and 29, 2021, and the Limited Soil Investigation Report was approved by the NYSDEC on January 19, 2022.

Site preparation work completed by VERTEX, or its subcontractors included the following:

**Mobilization** – Mobilization was conducted as necessary for each phase of work at the Site, and included field personnel orientation, equipment mobilization (including securing all sampling equipment needed), and utility mark-outs. Each field team member attended an orientation meeting to become familiar with the general operation of the Site, health and safety requirements, and field procedures.

**Erosion and Sedimentation Controls** – All work was conducted in the basement and parking deck of the Site building and no erosion or sedimentation controls were warranted.

**Utility Mark-Out** – The presence of utilities and easements on the Site were fully investigated prior to the performance of invasive work by using, at a minimum, the One-Call System (811) was notified. A geophysics subcontractor was also retained to conduct a geophysical survey using ground-penetrating radar (GPR) and electromagnetic equipment to mark-out subsurface utilities, evaluate drains and subsurface piping, and “clear” proposed drilling, IRM excavation, and SSDS trench locations.

**Sheeting and Shoring** – Due to the limited size of the SSDS piping trenches (six inches wide by 12 inches deep) and IRM excavation (2.0 feet by 2.0 feet by 3.0 feet deep), sheeting and shoring was not required.

**Dewatering** – Dewatering was not required during remediation and construction activities as groundwater is encountered approximately 17.5 to 21.8 feet below the basement slab and the SSDS piping trenches were one foot deep and IRM excavation was three feet deep.

**Equipment and Materials Staging** – Equipment and materials were stored and staged within the Site property limits, within the on-site loading dock and basement storage room.

**Pre-Construction Meeting** – A pre-construction meeting was held at the site with the NYSDEC case manager on December 6, 2018.

**Approvals/Permits** – Documentation of agency approvals required by the RAWP is included in **Appendix C**. Other non-agency permits relating to the remediation project (i.e., building permits, Landmark Preservation Commission, etc.) are also provided in **Appendix C**. No State Environmental Quality Review Act (SEQRA) requirements and or substantive compliance requirements for attainment of applicable natural resource or other permits were required during this Remedial Action.

### General Site Controls

The Site is an active office/commercial building with parking garage. The remedial activities were performed within the basement, ground-level loading dock, and parking garage.

**Work Hours** – The hours for operation of remedial construction conformed with the New York City Department of Buildings (NYCDOB) construction code requirements or according to specific variances issued by that agency. Due to the presence of active tenant spaces in the basement of the Site building, soil excavation at soil sample location RF-9, and the SSDS installation work was performed after typical work hours (5 PM to 8 AM) and/or on the weekend to limit tenant disruptions. All slab penetrations, trenches, and boring locations were restored daily to avoid tripping hazards and potential vapor exposure to employees and customers.

**Site Security** – Site access was controlled through locked exterior doors and a security guard located in the lobby of the building.

**Job Site Record Keeping** – In order to thoroughly document the field activities, the following records were maintained: field logs detailing daily activities, observations, and measurements were kept by field personnel; soil boring logs were maintained to record soil lithology; chain of custody records accompanied field samples from the Site to the laboratory; photographs were collected daily by field personnel to document work completed and Site conditions; and equipment calibration records provided by equipment rental companies were maintained in the project folder.

**Erosion and Sedimentation Controls** – All work was conducted in the basement and parking deck of the Site building and no erosion or sedimentation controls were warranted.

**Equipment Decontamination and Residual Waste Management** – Sampling equipment was decontaminated between sampling locations by removing all visible soil using a potable water rinse, followed by washing with Liquinox or other similar laboratory-grade detergent, and finally a rinse with distilled water. Disposable sampling equipment including, spoons, gloves, bags, paper towels, etc. that encountered environmental media was double bagged and disposed as municipal trash in a facility trash dumpster as general refuse.

**Soil Screening** – Visual, olfactory, and photoionization detector PID screening of soils was completed during all intrusive work. The PID was calibrated to 100 ppm by volume of isobutylene. The PID readings, soil lithology, and field observations will be documented in the field by VERTEX.

**Stockpile Management** – Stockpiling was not required as part of the remedial activities.

**Problems Encountered** – Proposed sub-slab monitoring point No. 11 could not be installed during the installation of the SSDS. On August 25, 2021, VERTEX attempted installation of the sub-slab monitoring point at several nearby locations within the basement storage room. Installation was not feasible due to the concrete foundation that was greater than 10 inches thick and accessibility issues due to building mechanicals located within that area. Based on a review of the locations of the other 10 sub-slab monitoring points and the vacuum readings that are well above the minimum that have been measured with the SSDS operational, VERTEX opines that the SSDS is operating as designed to maintain a negative pressure gradient throughout the building footprint and that this monitoring point is not required.

### Nuisance Controls

**Truck Wash / Egress Housekeeping** – Loading of vehicles (equipment, materials, drums of soil or groundwater, etc.) was conducted within the loading dock in the Site building. Housekeeping measures consisted of maintaining the concrete loading dock broom-swept clean. No truck washing was required during the remedial activities.

**Dust Control** – Dust (particulate matter) was controlled during the saw cutting and excavation of the SSDS piping trenches in the basement of the Site building. Dust control measures were used during excavation activities such that no visible dust migration was observed. The following dust suppression techniques were used: water application on or adjacent to the construction area; water spray equipment and trench faces; restricting square footage of open trenches; and hauling materials in properly covered containers.

**Odor Control** – No odor issues were encountered during the remedial activities.

**Traffic Control** – Impacts to traffic were minimal during the remedial activities. The environmental and remedial contractors directed the arrival and departure of construction vehicles. Traffic related to the RAWP activity was limited to daily arrival, parking, and departure of contractor support vehicles and a VERTEX personnel. Vehicle parking consisted of the on-site parking garage or on-street parking spaces.

**Complaint Management** – No citizen complaints were received during the completion of the remedial activities.

### CAMP Results

During the installation of the SSDS (September 2020 and May 2021) and Limited Soil Investigation (October 2021) in the Site building basement, a CAMP was implemented. All individuals not directly involved with the work were not permitted to occupy the room in which the installation and/or investigation activities were being conducted. Continuous monitoring locations for VOCs and particulates were established to monitor potentially exposed individuals and adjacent occupied rooms. If total VOC concentrations opposite walls of occupied rooms or next to intake vents exceeded 1 part per million (ppm), monitoring occurred within the occupied room. Background readings in the occupied rooms were collected prior to commencement of the investigation activities. If total particulate concentrations opposite the walls of the occupied rooms or next to intake vents exceeded 150 mcg/m3, work activities were suspended until controls were implemented and were successful in reducing the total particulate concentration to 150 mcg/m3 or less at the monitoring point.

During the completion of the SSDS installation and Limited Soil Investigation activities, VOC concentrations within the work area ranged from 0.0 to 0.5 ppm. VOC concentrations collected in the adjoining hallway and adjoining vacant tenant spaces ranged from 0.0 to 0.5 ppm. Total particulate concentrations within the work area ranged from 0.26 to 2.73 mcg/m3, and particulate concentration in the hallway and adjoining vacant tenant spaces ranged from 0.07 to 1.09 mcg/m3.

Based on the CAMP readings collected during the investigation and remedial activities, no air monitoring concerns were identified.

### Reporting

Daily field logs were prepared by field staff during the remedial activities. The field logs summarized the day’s activities, on-site equipment, personnel, and visitors, samples collected, and any issues related to health and safety, scope of work, equipment, and scheduling. Monthly progress reports were provided to the NYSDEC/NYSDOH.

All daily and monthly reports are included in electronic format in **Appendix D**.

The digital photo log required by the RAWP is included in electronic format in **Appendix E**.

## CONTAMINATED MATERIALS REMOVAL

Materials removed during the remedial activities included soil from the installation of the SSDS trenches and IRM excavation. Excavated soils were placed into a 55-gallon steel drum. The drum was labeled and stored inside a secured loading dock at the Site, pending off-site disposal.

On September 30, 2020, the drum was transported off-site to Republic Environmental Systems (PA), LLC in Hatfield, Pennsylvania for disposal as non-hazardous waste. A copy of the drum disposal manifest is included as an **Appendix F**.

A list of the SCOs for the contaminants of concern for this project is provided in **Table 1**.

A figure depicting the location of original sources and areas where excavations were performed is shown in **Figure 2**.

## REMEDIAL PERFORMANCE/DOCUMENTATION SAMPLING

Data Usability Summary Reports (DUSRs) were prepared for all data generated in this remedial performance evaluation program. These DUSRs are included in **Appendix G** and associated laboratory reports are provided electronically in **Appendix H**.

### IRM Post-Excavation Soil Sampling

To confirm the protectiveness of the IRM soil remediation, a post-excavation soil sample was collected from the base of the excavation on September 27, 2020. The soil sample collected exhibited a PID reading of 0.0 ppm. The post-excavation soil sample (RF-9-PX) was collected at 3.0-3.5 feet below the basement slab and submitted for VOC analysis. The location of the post-excavation soil sample is depicted on **Figure 2**.

As discussed in Section 3.1, only acetone was detected in exceedance of the NYSDEC SCOs. Acetone was detected at 0.055 mg/kg, exceeding only the UUSCO of 0.05 mg/kg. A summary of the post-excavation soil analytical results is provided as **Table 2**. Acetone is a typical laboratory contaminant, and the low-level detection is expected to be a result of laboratory contamination. No further investigation or remediation was warranted for this area.

### SSDS Extraction Point Soil Sampling

During the installation of the horizontal SSDS piping trenches, VERTEX collected 14 soil samples (VTX-101 to VTX-114) at the extraction points. In September 2020 and May 2021, a hand auger was used to advance a soil boring below the basement slab. Shallow refusal was encountered at all sample locations due to the presence of fill material containing brick and concrete. The boring locations are depicted on **Figure 2**.

The soils were screened with a PID from the soil intervals at 0.0 to 2.0 feet below basement slab and 2.0 to 4.0 feet below basement slab. A soil sample for VOC analysis was collected from the interval exhibiting the highest PID reading. No elevated PID readings were identified, and PID readings ranged from 0.0 to 3.0 ppm. Due to the shallow refusal and lack of elevated PID readings, soil samples were collected from the deepest depth obtained.

During the September 2020 sampling event, no VOCs were identified in exceedance of the NYSDEC SCOs, except for the following: VTX-108 collected at 1.0-1.5 feet below basement slab contained acetone at 0.064 mg/kg, exceeding the UUSCO (0.05 mg/kg) only; VTX-111 collected at 1.0-1.5 feet below basement slab contained acetone at 0.15 mg/kg, exceeding the UUSCO only; and VTX-112 collected at 2.0-2.5 feet below basement slab contained acetone at 0.26 mg/kg, exceeding the UUSCO, and 2-butanone at 0.23 mg/kg, exceeding the UUSCO (0.12 mg/kg) only. Acetone and 2-butanone are typical laboratory contaminants, and the low-level detections are expected to be the result of laboratory contamination.

During the May 2021 sampling event, soil analytical results identified detections of PCE at 19 mg/kg and 16 mg/kg, at VTX-113 and VTX-114, which concentrations are well below the RUSCO-C of 150 mg/kg; however, the concentrations exceeded the UUSCO/RUSCO-GW of 1.3 mg/kg. An additional soil investigation was conducted in this area of the Site, as is discussed in Section 4.4.3.

A summary of the soil analytical results is provided as **Table 3** and the laboratory reports are included in **Appendix H**.

### Limited Soil Investigation

Soil sampling performed during the installation of the SSDS extraction points identified two sample locations (VTX-113 and VTX-114) containing PCE detections which exceed the RUSCO-GW. In October 2021, nine soil borings (B-1 through B-9) were advanced in the southeast portion of the Site building to further evaluate soil conditions and assess whether a chlorinated volatile organic compound (CVOC) source area was present. The boring locations are depicted on **Figure 2**.

Soil sampling was conducted after startup of the SSDS at the NYSDEC-requested intervals or at the highest PID reading at each of the soil boring locations. In accordance with the NYSDEC-approved Limited Soil Investigation Work Plan, soil sampling was conducted at two-foot intervals at borings B-3, B-6, and B-8, to determine the vertical extent of PCE impacts at these areas. At all other soil boring locations, soil samples were collected from the location of the strongest evidence of suspected impacts based on PID readings, odors, or staining and the bottom of each boring. For locations where the PID was malfunctioning (B-3, B-6, B-8), samples were taken every two feet, and the shallow soil intervals were analyzed to provide vertical delineation of the previously elevated samples at VTX-113 and VTX-114. A total of 18 soil samples were analyzed for VOCs. Samples were collected at depths ranging from 0.5 to 14.5 feet below the basement slab.

None of the soil samples contained CVOC concentrations exceeding the NYSDEC SCOs. A total of two sample locations (B-2 and B-5) contained acetone exceeding the UUSCO only. Sample B-2, collected at 14.5-15.0 feet below the basement slab, and sample B-5, collected at 0.5-1.0 feet below the basement slab, both contained an acetone concentration of 0.11 mg/kg, which exceeds the UUSCO of 0.05 mg/kg. Acetone is a typical laboratory contaminant, and the low-level detections are expected to be the result of laboratory contamination. A summary of the soil analytical results is provided as **Table 4** and the laboratory reports are included in **Appendix H**.

Based on the findings of the Limited Soil Investigation, no CVOC source area was identified at the Site. Horizontal and vertical sampling to delineate previous soil samples VTX-113 and VTX-114 with elevated PCE detections identified no exceedances to the SCOs. The previous soil sample locations were from areas immediately below the horizontal extraction points for the active SSDS; therefore, it is expected that any previously detected residual impacts would be remediated via the continued operation of the SSDS since July 2021, as the system will act as a soil vapor extraction system to strip the VOCs from the porous soils.

### SSDS Effectiveness Testing

In accordance with the NYSDEC-approved RAWP, SSDS effectiveness testing was conducted during the heating season in November 2021. The vapor intrusion sampling included the collection of six sub-slab soil vapor samples (VTX-SS1, VTX-SS3, VTX-SS5, VTX-SS7, VTX-SS9, and VTX-SS10), six collocated indoor air samples (VTX-IA1, VTX-IA3, VTX-IA5, VTX-IA7, VTX-IA9, and VTX-IA10), and one ambient air sample (VTX-AA1). All samples were analyzed for the presence of VOCs by USEPA Method TO-15. The sample locations and analytical results are presented on **Figure 3** along with historical results.

Sub-slab soil vapor samples were collected from permanent vapor monitoring points, which were installed during the installation of the active SSDS. Teflon tubing was connected to the vapor monitoring point to facilitate the collection of soil vapor from beneath the concrete slab into laboratory-supplied, pre-cleaned, stainless steel 2.7-liter Summa® canisters. The tubing was connected to the Summa canister using a compression fitting. All sample trains were tested for leaks utilizing helium tracer test. All leak test results were deemed acceptable. The entire sample train was purged of approximately three air volumes prior to sample collection at a rate that did not exceed 200 milliliters per minute. Following purging, the sample valves of the Summa canisters were opened to initiate sample collection. The sub-slab samples were collected over an approximate 15-minute timeframe. Following sample collection, the tubing was removed, and the cap was placed back onto the vapor monitoring point.

Indoor air samples were collocated proximate to, but collected in advance of, the sub-slab soil vapor sampling to be able to spatially compare the results. The indoor air samples were collected from indoor basement locations within the approximate breathing zone area. In addition, an ambient air sample was collected on the eastern exterior of the Site building, on the 83rd Street sidewalk. The indoor and ambient air samples were collected using laboratory-supplied, pre-cleaned, stainless steel 6-liter Summa canisters over an approximate 8-hour sample duration.

To evaluate the potential vapor intrusion concerns at the Site, VERTEX utilized the NYSDOH Soil Vapor/Indoor Air Matrix Guidance (May 2017), which presents decision-making matrices and provides recommended actions based on toxicity data and risk assessments for eight chemicals. The following is a summary of the findings and recommended actions for the constituents identified in exceedance of the soil vapor and/or indoor air criteria.

The sub-slab soil vapor results are summarized in **Table 5**, the basement indoor air and ambient air results compared to the NYSDOH matrix criteria is presented in **Table 6**, and the basement indoor air and ambient air results compared to NYSDOH air guidance values is presented in **Table 7**. The laboratory reports are provided in **Appendix H**.

**cis-1,2-Dichloroethylene, 1,1-Dichloroethene, Methylene Chloride, Vinyl Chloride**

No concentrations of cis-1,2-dichloroethylene, 1,1-dichloroethene, methylene chloride, or vinyl chloride were detected in any of the sub slab samples, indoor air samples, or the ambient air sample. Based on the soil Vapor/Indoor Air Matrix, no further action is required.

**Trichloroethene (TCE)**

TCE was detected in three of the six sub-slab samples at a concentration equal to or less than 1.55 ug/m3. There were no corresponding detections of TCE in any of the indoor air samples or the ambient air sample. Based on the soil Vapor/Indoor Air Matrix, no further action is required.

**1,1,1-Trichloroethane (1,1,1-TCA)**

* At VTX-SS1/VTX-IA1, the soil vapor detection of 5.17 micrograms per cubic meter (ug/m3) and indoor air concentration of 6.71 ug/m3 requires no further action.
* Other detections were below the matrix values and requires no further action.

**Carbon Tetrachloride**

Carbon tetrachloride was detected at only one sub-slab location, VTX-SS10, and was detected at all indoor air locations and the ambient air location. It should be noted that carbon tetrachloride was identified in the ambient air sample collected in November 2021 at a concentration of 0.409 ug/m3 which was similar to and the same order of magnitude to all the indoor air locations and at the same concentration as collocated indoor air sample to sub-slab sample VTX-SS10. Based on these detections and concentrations, carbon tetrachloride is considered to be a result of ambient air and not vapor intrusion.

* At VTX-SS1/VTX-IA1, the soil vapor detection of non-detect and indoor air concentration of 0.478 ug/m3 requires no further action.
* At VTX-SS3/VTX-IA3, the soil vapor detection of non-detect and indoor air concentration of 0.635 ug/m3 requires no further action.
* At VTX-SS5/VTX-IA5, the soil vapor detection of non-detect and indoor air concentration of 0.459 ug/m3 requires no further action.
* At VTX-SS7/VTX-IA7, the soil vapor detection of non-detect and indoor air concentration of 0.692 ug/m3 requires no further action.
* At VTX-SS9/VTX-IA9, the soil vapor detection of non-detect and indoor air concentration of 0.465 ug/m3 requires no further action.
* At VTX-SS10/VTX-IA10, the soil vapor detection of 2.53 ug/m3 and indoor air concentration of 0.409 ug/m3 requires no further action.

**Tetrachloroethene (PCE)**

PCE was detected at all sub-slab sample locations, indoor air locations and the ambient air location. Only one of the six samples exceeded the matrix value for both sub-slab and indoor air. It should be noted that PCE was identified in the ambient air sample collected in November 2021 at a concentration of 1.99 ug/m3 which was similar to and the same order of magnitude to most of the indoor air locations which ranged in concentration from 2.14 to 4.66 ug/m3. Based on these detections and concentrations, there appears to be a contribution to indoor air from ambient air and not solely a result of vapor intrusion. Also of note, is that the highest concentration of PCE in indoor air did not correspond with the highest detection of sub-slab soil gas.

* At VTX-SS5/VTX-IA5, the soil vapor detection of 127 ug/m3 and indoor air concentration of 2.14 ug/m3 requires no further action (other than the continued operation of the SSDS).
* At VTX-SS10/VTX-IA10, the soil vapor detection of 85.4 ug/m3 and indoor air concentration of 4.66 ug/m3 requires no further action (other than the continued operation of the SSDS).

Evaluation of the soil vapor analytical data identified PCE at one location (VTX-SS5) in exceedance of the NYSDOH matrix sub-slab soil vapor concentration criteria. However, review of the soil vapor result at VTX-SS5 along with the co-located indoor air concentration (VTX-IA5) confirmed that pursuant to the NYSDOH Soil Vapor/Indoor Air Matrix Guidance (May 2017), no action is warranted. **Table 8** provides a summary of the co-located soil vapor and indoor air concentrations compared to the NYSDOH decision matrices.

In addition, while indoor air concentrations of 1,1,1-trichloroethane (1,1,1-TCA), carbon tetrachloride, and PCE were detected at concentrations exceeding the NYSDOH indoor air concentration criteria, none of the detected indoor air concentrations were identified in exceedance of the Indoor Air Quality Guidance Values (Table 3.1 in the NYSDOH *Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York* dated October 2006 and updated in September 2013 and August 2015). Elevated 1,1,1-TCA was detected in one indoor air sample (VTX-IA1); however, a review of the indoor air data along with the co-located sub-slab soil vapor sample (VTX-SS1) confirmed that no further action is warranted in accordance with the NYSDOH Soil Vapor/Indoor Air Matrix Guidance (May 2017). Elevated carbon tetrachloride was noted in all six indoor air sample locations, along with the ambient air sample; however, carbon tetrachloride was not detected in any of the co-located sub-slab soil vapor sample locations except VTX-SS10 where a concentration was detected but was below the lowest matrix value. Evaluation of the indoor air detections along with the co-located sub-slab soil vapor results confirmed that no further action is warranted in accordance with the NYSDOH Soil Vapor/Indoor Air Matrix Guidance (May 2017). Furthermore, as indicated by the detection of carbon tetrachloride in the ambient air sample at concentrations that were similar to the indoor air concentrations, the carbon tetrachloride detections in indoor air are likely attributed to ambient air and not vapor intrusion. Elevated PCE was noted in one indoor air sample (VTX-IA10); however, review of the indoor air data along with the co-located sub-slab soil vapor sample (VTX-SS10) confirmed no further action warranted in accordance with the NYSDOH Soil Vapor/Indoor Air Matrix Guidance (May 2017). PCE was also detected in the ambient air sample indicating that the indoor air detection can also likely be partially attributed to ambient air.

Based on the foregoing evaluation of the soil vapor data compared to the indoor air data using the NYSDOH Soil Vapor/Indoor Air Matrix Guidance (May 2017), no further monitoring or mitigation is warranted, beyond the continued operation of the SSDS, to address the vapor intrusion concern. All sample locations were identified as “No Further Action” with respect to the Soil Vapor/Indoor Air Matrices.

## IMPORTED BACKFILL

Imported material consisted of ¾-inch clean stone that was used as backfill at the SSDS extraction point locations and IRM soil excavation at the location of RF-9. Approximately two cubic yards of Sakrete All-Purpose Gravel was used as backfill at the Site. The stone was purchased from a local home improvement store in 0.5-cubic foot (60 pound) bags. A copy of the backfill documentation is included in **Appendix I**.

## CONTAMINATION REMAINING AT THE SITE

Based on the remedial investigation findings, the primary contaminants of concern (COCs) at the Site are CVOCs that were identified in soil, groundwater, and sub-slab soil vapor.

### Soil

Two soil samples (VTX-113 and VTX-114) collected in May 2021 during the installation of the extraction points for the SSDS contained detections of PCE at 19 mg/kg and 16 mg/kg, which exceed the RUSCO-GW of 1.3 mg/kg. The samples were collected at 1.0-1.5 feet below the basement slab. As discussed in Section 4.4.2, nine soil borings were advanced in the southeast portion of the Site building in October 2021 to further evaluate soil conditions and assess whether a CVOC source area was present. Horizontal and vertical sampling to delineate previous soil samples VTX-113 and VTX-114 with elevated PCE detections identified no exceedances to the SCOs. The previous soil sample locations were from areas immediately below the horizontal extraction points for the active SSDS; therefore, it is suspected that any previously detected residual impacts were remediated via the continued operation of the SSDS since July 2021, as the system act as a soil vapor extraction system to strip the VOCs from the porous soils.

A total of 19 soil samples were analyzed for pesticides and metals during the February 2019 remedial investigation activities. Six soil sample locations contained one or more pesticides (4,4’-DDD, 4,4’-DDE, 4,4’-DDT, and/or dieldrin) exceeding the SCOs and two locations (RF-2 and RF-4) contained metals (cadmium, copper and/or zinc) concentrations exceeding the SCOs. These detections are typical of historic fill such as the fill material observed at the Site.

**Table 9** and **Figure 2** summarize the results of all soil samples collected that exceed the Unrestricted Use and Protection of Groundwater SCOs at the Site after completion of remedial action.

### Groundwater

A total of 23 groundwater samples have been collected at the Site via three temporary monitoring wells and 10 permanent monitoring wells. The CVOCs identified at concentrations exceeding the NYSDEC Ambient Water Quality Standards (AWQS) include PCE, TCE, and cis-1,2-dichloroethene (cis-1,2-DCE). Concentrations of PCE exceeding the AWQS of 5 micrograms per liter (ug/L) ranged from 17 to 420 ug/L. Concentrations of TCE exceeding the AWQS of 5 ug/L ranged from 5.8 to 11 ug/L. Concentrations of cis-1,2-DCE exceeding the AWQS of 5 ug/L ranged from 18 to 57 ug/L.

Groundwater flow direction was documented at the Site to be northwest (March and June 2019) and southwest (April 2020). CVOC impacts in groundwater were identified in the up-gradient monitoring wells on the Site (MW-1, MW-3, MW-8, and MW-10) and up-gradient off-site wells (MW-4 and MW-5). Review of the groundwater data for the down-gradient monitoring wells (MW-2, MW-6, MW-7, and MW-9) identified no CVOC concentrations exceeding the AWQS or NYSDEC Groundwater Effluent Limitation (Class GA) standard. The groundwater impacts are delineated in the down-gradient direction and extend from up-gradient of the Site building to beneath the footprint of the Site building.

During the April 2020 groundwater sampling event, petroleum-related VOCs (1,2,4,5-tetramethylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, isopropylbenzene, n-propylbenzene, and naphthalene) were identified in monitoring wells MW-6, MW-9, and MW-10 at concentrations exceeding the AWQS. These compounds are not COCs associated with the former on-site dry-cleaning operations and are likely associated with degraded heating oil and could be associated with an off-site release. Review of the NYSDEC Bulk Storage Database identified the Site with unregulated/closed Petroleum Bulk Storage (PBS) No. 2-207845, with a closed/removed 1,500-gallon No. 2 heating oil underground storage tank (UST). Based on registration data associated with the UST, tThe steel tank was situated within a vault, and the location of the UST and vault is unknown. No closure documentation was available; however, there is no NYSDEC spill number associated with the former UST. The Site building is currently serviced by natural gas, and no anomalies indicative of USTs were identified during the geophysical evaluations completed at the Site.

**Table 10** and **Figure 4** summarize the result of all samples of groundwater that exceed the AWQS and/or Class GA.

### Soil Vapor

Evaluation of the initial soil vapor analytical data identified concentrations of carbon tetrachloride, TCE, and PCE in exceedance of the NYSDOH matrix sub-slab soil vapor concentration criteria. The highest concentrations were identified in the southeast portion of the Site. As discussed in Sections 2.3.2 and 2.3.12, the evaluation of soil vapor data compared to the co-located indoor air data and ambient air data collected after the IRM using the NYSDOH Soil Vapor/Indoor Air Matrix Guidance (May 2017) confirmed that no further monitoring or mitigation is warranted, beyond the continued operation of the active SSDS, to address the vapor intrusion concerns. All sample locations were identified as “No Further Action” with respect to the NYSDOH Soil Vapor/Indoor Air Matrices.

**Table 7** and **Figure 3** summarize the results of all samples of soil vapor that exceed standards, criteria, and guidance values (SCGs) after completion of the remedial action.

## ENGINEERING CONTROLS

Since contaminated soil, groundwater, and soil vapor remains beneath the site after completion of the Remedial Action, Institutional and Engineering Controls are required to protect human health and the environment. These Engineering and Institutional Controls (ECs/ICs) are described in the following sections. Long-term management of these EC/ICs and residual contamination will be performed under the Site Management Plan (SMP) approved by the NYSDEC.

### COVER SYSTEM

Exposure to remaining contamination in soil/fill at the site is prevented by a cover system placed over the site. This cover system is comprised of concrete sidewalk (approximately 4-inch-thick concrete and 2-inch base stone layer), brick-covered sidewalk (approximately 3.5-inch-thick brick and 2-inch base stone layer), and concrete building slab (approximately 4-inch-thick concrete). Figure 9 presents the location of the cover system and applicable demarcation layers. **Figure 5** shows the location of each cover type built at the Site. An Excavation Work Plan, which outlines the procedures required in the event the cover system and/or underlying residual contamination are disturbed, is provided in Appendix D of the SMP.

### SUB-SLAB DEPRESSURIZATION SYSTEM

The SSDS at the Site consists of 14 below-grade extraction points installed within horizontal trenches, which consist of five-foot lengths of two-inch diameter slotted poly vinyl chloride (PVC) well screen (0.020-inch slot size) with socks, set in ¾-inch clean stone, with caps at the ends of each piping run. One extraction point consists of a one-foot length of slotted PVC well screen. The below-grade horizontal piping runs consist of solid two-inch, three-inch, and four-inch Schedule 40 PVC pipe. Vertical piping consisting of four-inch diameter Schedule 40 steel transitions from the basement floor through the loading dock in the northeastern corner of the Site and up to the parking deck area.

Three Dwyer Minihelic® 0-10 inches of water column pressure gauges are installed along the below grade piping runs to monitor vacuum and to act as sample points within the runs.

Three “valves” consisting of 12-inch sections of rubber hose in-line with the below-grade piping were installed to be able to adjust flow within the system. Air flow can be adjusted by exposing and pinching the hose if needed.

Flow is imparted with the use of one Dayton® high pressure, direct drive, radial blade blower (rated for up to 200 cubic feet per minute and five inches of water column). In accordance with NYSDOH guidance, the exhaust was located at least 10 feet from any operable openings or air intakes. The blower is connected electrically to its own circuit in an existing electrical panel and improved with an exhaust silencer for noise reduction.

Ten permanent, sub-slab monitoring points (Mini Vapor Pin®) were installed to be able to monitor below grade vacuum and contaminant concentrations.

An alarm (Radon Away™ Checkpoint IIA) was installed on the system to warn of a loss of system vacuum.

**Figure 6** shows the location of the SSDS installed at the Site. As-built drawings, signed and sealed by a Professional Engineering (PE) who is licensed and registered in New York State, and component specifications are included in **Appendix J**.

Procedures for monitoring, operating and maintaining the SSDS are provided in the Operation and Maintenance Plan in Section 5.0 of the Site Management Plan (SMP). The Monitoring Plan also addresses inspection procedures that must occur after any severe weather condition has taken place that may affect on-site ECs.

## INSTITUTIONAL CONTROLS

The site remedy requires that an EE be placed on the property to (1) implement, maintain, and monitor the Engineering Controls; (2) prevent future exposure to remaining contamination by controlling disturbances of the subsurface contamination; and (3) limit the use and development of the Site to restricted residential, commercial, and industrial uses only.

The EE for the Site was executed by the NYSDEC on October 6, 2020, and recorded by the Office of the City Register of the City of New York on December 14, 2020. The City Register File Number for this filing is 2020000355292. A copy of the easement and proof of filing is provided in **Appendix K**.

## DEVIATIONS FROM THE REMEDIAL ACTION WORK PLAN

The following provides a summary of all deviations from the RAWP:

* Proposed sub-slab monitoring point No. 11 could not be installed during the installation of the SSDS. On August 25, 2021, VERTEX attempted installation of the sub-slab monitoring point at several nearby locations within the basement storage room. Installation was not feasible due to the concrete foundation that was greater than 10 inches thick and accessibility issues due to building mechanicals located within that area. Based on a review of the locations of the other 10 sub-slab monitoring points and the vacuum readings that are well above the minimum that have been measured with the SSDS operational, VERTEX opines that the SSDS is operating as designed to instill a negative pressure gradient throughout the building footprint and that this monitoring point is not required.

**FIGURES**

**TABLES**

**Appendix A:**

**SURVEY MAP, METES, AND BOUNDS**

**Appendix B:**

**DIGITAL COPY OF FER (CD)**

**Appendix C:**

**APPROVAL AND PERMITS**

**Appendix D:**

**DAILY AND MONTHLY REPORTS**

**Appendix E:**

**PHOTO LOG**

**Appendix F:**

**DRUM DISPOSAL MANIFEST**

**Appendix G:**

**DATA USABILITY SUMMARY REPORTS**

**Appendix H:**

**LABORATORY REPORTS**

**Appendix I:**

**BACKFILL DOCUMENTATION**

**APPENDIX J:**

**SSDS DRAWINGS AND COMPONENT SPECS**

**APPENDIX K:**

**ENVIRONMENTAL EASEMENT**